MARINE REEF ECOSYSTEM DEGRADATION IN EAST HAWAII: BRIDGES TO COMMUNITY BASED MARINE MANAGEMENT

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INTRODUCTION

The State of Hawai`i is a destination for many people seeking a new home and a new way of life for those retiring, and the many tourists who want a glimpse of island life or "paradise." The largest island, Hawai`i, or known commonly as the "Big Island" serves as a main port of call and has 1.8 million acres of agricultural land. The large landmass of this island provides a unique ecosystem with higher elevations that can produce snowfall to areas of dry desert-like conditions that contrast with the humid rainforest and wind patterns. It is one of the reasons that the Big Island has a growing population of residents and is an attractive destination to tourists.

A newcomer this year to the tourism industry is the introduction of the Norwegian Cruise Line industry. The Cruise Line industry is projected to increase the visitor population in 2006 by 500,000 visitors on the Big Island as projected by the Hawaii Visitor Convention Bureau. With the increase of visitors from the Cruise Line industry and others, there has been an increase to many types of activities that include agrotourism, ecotourism and marine recreational activities.

With the new increase in population, both residential and tourism, there continues to be an increase of activities at our beaches and in the ocean with marine recreational activities. Many of these activities such as kayaking and thrill craft water recreational vehicles or “jet skis” are new to island style of living and have brought about much discussion on the preservation of the surrounding marine environment and ecosystems. These marine ecosystems include coral reefs, fish and invertebrate habitats, native algae species and anchialine pond areas. Another aspect of marine environment is the prevention of pollution and safety measures for beach, tidal ponds and water safety.

These marine activities provide economic development and include saltwater aquarium fishing, the snorkeling and diving industry, recreational canoe paddling, sport and commercial fishing. The aquarium fishing industry alone was reported to “gross annual sales at an estimated $3.2 million.” (Davidson, K., Hamnett, M., and Minato, C., 2005). Another marine recreational activity that is growing is with thrill craft water recreational vehicles commonly known as “jet skis.” Thrill craft instructor, Jim Howe (2005), validates that “In general, this is the fastest growing area of boating recreation and I believe we can expect to see more and more of these crafts in Hawaii’s waters.” He also writes on tow-in surfers that catch waves as being the most popular group in the State and “the popularity of the sport has caused overcrowding at certain surf sites.” (J. Howe, personal communication, November 15, 2005).

Overcrowding at our beaches and surf sites is a marine safety concern with snorkelers, divers, kayakers, surfers and jet skis all in the same proximity. Health and safety with individuals are also an issue with marine safety and environment.

Island people are deeply connected to the ocean that is our “second” home where residents gather and celebrate the environment that sustains our lives. Included with these activities are social activities that include family and group activities that occur at our beaches with picnics, baby luau’s and weddings. It is not unusual for families to enjoy pole fishing from the shoreline or spearing and netting for fish together on the weekends. In the afternoons, canoe paddling is a common sight in Hilo Bay and on the weekends there are paddling Regattas and fishing tournaments. The ocean and its beaches have provided social capacity of recreational, cultural and ecological value that local residents want to ensure for future generations.

Hawaiian culture has great respect for the ocean that our Ancestors traveled and navigated to this homeland. Navigation was done through the use of the Hawaiian moon calendar that was valued as a way of life for farmers and fishermen with their livelihood and taught them agricultural and aquacultural traditions that are still used till today. (Malama Hawaii Polynesian Voyaging Society, 2001) Native Hawaiians and long time residents have a great respect for the ocean that is treated with humanistic qualities and honor. These different cultural values that Native Hawaiians and long time residents have are part of the spiritualistic connection that is felt between the land and the ocean. The Hawaiian creation chant, Kumulipo, has life being formed out of darkness from the chaos of the ocean to the land. (Beckwith,

1951) The Kumulipo is a mele ko`ihonua or genealogical that reminds Native Hawaiians of their connection to the universe. Native Hawaiian Cultural Specialist and Educator, Pualani Kanaka`ole Kanahele, (2003) reminds us that the Kumulipo relates:

> "the extreme movements of the ocean, and caused the eyes of the land and sea to bloom and it dictated the time for earth to commence or rest from production. The sun and rain were the penetrating nourishing forces into the earth. The wind, ocean currents and rivers provided mobility for things and objects incapable of movement. The Hawaiian and all other natural forms of his world were the beneficiaries of this primal cadence and flow with the rhythm of the universe."

Today the Kumulipo chant can be revisited at the *Mokupapapa Discovery Center for Hawaii's Remote Coral Reefs* that is located in downtown Hilo and has provided educational materials and tours for school children, residents and tourists. The Center focuses on the coral reefs of the Northwestern Hawaiian Islands, however, it includes education on the entire reef systems of the Hawaiian Islands.

The coral reefs are important in providing the quality of life that is sustainable and enjoyable with our beaches. Many of us do not realize that it is the coral reef that provides us with waves and sand to play in with our families and friends. Community members and visitors alike need to find ways to continue respecting the ocean through education and in providing stewardship for our marine life and conservation for sustainability. Conservation will need to include other natural

environmental factors and potential effects of humans that play a part in the marine ecosystem of East Hawaii and Hilo Bay.

TSUNAMI INUNDATION AND HAZARDOUS ASSESSMENT OF HILO BAY

East Hawai`i has suffered and known the natural hazards of tsunami generated waves from earthquakes generated from Alaska and Chile. Today, Hilo is currently known as the “Tsunami Capital” of the United States due to its local topography and bathymetry or the measurement of sea level (Pacific Tsunami Museum). Local residents of Hilo have experienced and felt the devastation of tsunami activities that reached its shorelines, homes and land areas. As a child, I remember the tsunami evacuation drills practiced in the public school that I went to that was later destroyed by the 1964 tsunami. I have witnessed the rolling waves as it has entered our coastal town of Hilo and know what the tsunami of 1960 and 1964 had done to change many lives. These tsunamis were not as powerful as the 1946 tsunami of my parents, but experiences with them are ingrained in the memories of many residents. Like many residents who have experienced the power of tsunami activity that has changed land formations and ocean habitats, we continue on with the quality of life we enjoy in Hawaii. Yet, tsunami activity is a reality of life here that we coexist with in knowing that it can affect residents again in Hilo town.

Mary O Brien (2001) uses the terms “risk and alternative assessment” in her book, *Making Better Environmental Decisions: An Alternative to Risk Assessment*; however, in relationship with this study of marine coastal environments much of the research is focused on hazardous assessment with tsunami and ocean activities.

An example is a hazardous assessment that was prepared by the National Oceanic and Atmospheric Administration (NOAA) and the Pacific Marine Environmental Laboratory documented as the *Tsunami Hazard Mitigation Plan* (1995). This hazard assessment was prepared in 1995 for the United States Senate to create partnerships between Federal, State and County agencies. In relationship to Hawaii – it is common knowledge that the coastal areas of East Hawaii and Hilo Bay have ideal land formations for tsunami wave formations. The Pacific Tsunami Museum (2005) describes Hilo Bay as a coastline that appeals to the formation and directional approach of tsunami waves. The bay is funnel shaped and allows the tsunami's wave energy to heighten the level of wave successions (http://www.tsunami.org/faq.htm).

The *Tsunami Hazard Mitigation Plan* (1995) has recommendations to use input from local people who have been affected by tsunami devastation in developing solutions with tsunami threats (pg 5). Recommendations are in the areas of education in understanding tsunami warning messages, standardizing hazardous zones and evacuation signs, and establishing state tsunami centers with emergency planners (pg 9). The State of Hawaii was found to have implemented many of the recommendations with its published evacuation maps in local telephone directories, monthly warning signal practices and education done in public schools. Local residents and visitors can locate the tsunami map areas in the yellow tabbed front sections labeled "Disaster Preparedness Info" in all phone books printed in Hawaii on each island. Monthly siren watches are done on the first day of each month at 12:00 noon and a public radio announcement is done on all radio and

television stations before it begins. The *Verizon February 2005 Hawaii Island Telephone Book* also contains information on other natural hazards such as flash flooding, earthquakes, hurricane and high surf (p. 32-44).

The *Tsunami Hazard Mitigation Plan* study did not indicate the types of hazards that could be left after a tsunami had already entered and left an area. In this area it was lacking and there are no indicators from Federal Emergency Management Agency (FEMA) for recovery of families that have lost lives, are homeless from property damage and have no income due to loss of employment or businesses. Another area is with loss of marine and land formations in relationship to our environment or with visible land changes created with the strong waves that can sweep far inland into communities.

There are oral narratives of the devastation and destruction of the 1946, 1960 and 1964 tsunamis that can be found at the Pacific Tsunami Museum in Hilo. There are very few narratives that describe the changes with marine ecosystems; however, in *Kuu Home I Keaukaha,* Eva Kauka Malo, a local Hawaiian resident, makes a reference. She describes Bakers Beach in Hilo and that after the 1946 Tsunami, a Hawaiian seaweed or limu, huluhuluwaena, that could be gathered as a food source became very rare and difficult to find (Akoi, 1989, p. 39).

Tsunami inundation creates reef damage, loss of beaches, property damage and reduces shoreline access. It affects many lives that are not addressed in this hazardous assessment. This hazardous assessment has a very narrow scope when dealing with a situation that can affect many lives. It prepares us on emergency

preparedness in the event a tsunami may occur, but leaves out many other factors that are associated with tsunami devastation.

An alternative assessment with tsunami inundation would have included aspects of social and cultural considerations along with environmental clean up of affected areas. All living things share our environment and land that we know of which has been affected not only by tsunami inundation, but also by high surf, pollution from storms and run-off from flooding. All of these occurrences are part of tsunami inundation with our Hilo Bay and eastern coastlines that still struggle till today to recuperate from these types of natural events.

The restoration of environmental health of the shorelines can be assisted with limiting and restricting new building developments along our shorelines and within tsunami designated areas. This would also save many lives, reduce the loss of businesses and protect our marine ecosystems to have a chance to flourish once again. The 1964 tsunami did affect many families who were relocated to other upper land areas in the Waiakea district; however, the Hilo downtown business area continues to be in its original location. Many of the downtown businesses continue to do “business as usual” yet flooding in these areas continues to seep sewage into the Hilo Bay area.

The Downtown Hilo area is described in the *Envision Downtown Hilo* homepage as being:

> “Located in a Special Management Area, in a flood zone area and the tsunami inundation zone. While Hilo Bay has been identified as an area of natural beauty in the

> General Plan, it is also one of the impaired waters in the Hilo Watershed area. As a shoreline town with these and other growth-related challenges, there is a critical need to develop a workable plan before the burgeoning population and increase in business and development puts an undo stress on the physical, economic and social environments" (http://hilo2025.org/index2.html).

There are no plans to relocate businesses in the area and the Envision Downtown Hilo workshop sessions for a Master Plan identified issues of concerns with water safety and dealing with flood zone restrictions. Many buildings in downtown Hilo are dilapidated and have been "grand-fathered" from new zoning laws and requirements that protect water quality and environmental health concerns.

An alternative assessment could consider the following options:

1) Ways to advocate and educate business owners on alternative methods to be environmentally conscious with remodeling and reconstruction of existing buildings.
2) Redevelopment of proper drainage systems and reducing surface water and sediment runoff.
3) Assessment of current roadways and its relationship with runoff from flooding and high surf.
4) A highway impact assessment on removing Bay Front Highway that is next to the shoreline and beach. Older local residents feel that the highway has created the shoreline beach to disappear.

Alternative assessment with redevelopment may even consider incentives for those who take action in the form of public relations and goodwill toward the environment.

HILO BAY AS A STATE WATERSHED AREA

In 1992, the Environmental Protection Agency (EPA) funded a Statewide Watershed Project and the State of Hawaii Department of Health received funds to become part of this program. Part of the process was evaluating and locating water systems such as rivers, channels and Bay areas on water quality and developing a plan to improve “impaired” or polluted waterways (Hilo Bay Watershed Project Public Input, Final Report, May 2004, p. 3-4).

In the County of Hawaii, the Hilo Bay Watershed Advisory Group (WAG) was formed to develop a plan in accordance with the EPA and with funds from the Clean Water Act 319 the state of Hawaii received. The Environmental Center of the University of Hawaii was contracted as the overall agency for State of Hawaii to gather information from advisory groups on nine specific elements stated in the Clean Water Act.

The Hilo Bay WAG consisted of several volunteers from government agencies such as the Department of Health, Department of Land and Natural Resources, Department of Forestry and Wildlife. Volunteers from community related organizations varied from Kamehameha Schools, the Downtown Hilo Association and Hawaiian Cultural Practitioners.

The Hilo Bay Watershed area consists of 463,577 acres and includes two large rivers – the Wailuku and Wailoa. Other smaller rivers are the Honolii, Malii,

Pauka, Pukihae and Wainaku. The watershed area consists of agricultural lands, forestry and conservation land districts, urban and rural land development. The rainfall in the watershed area is the highest on the island of Hawaii. Much of the rainfall is dependent upon elevation and consists of 120-inches-per-year along the coastline to 240-inches-per-year on the mountain slopes of Mauna Kea and Mauna Loa. The water in the watershed area consists of surface fresh water from Wailuku River and ground fresh water that flows through Wailoa River to Hilo Bay.

In relationship to alternative assessments with water quality, the Hilo Bay WAG report indicates that the organization with community input have taken different approaches than what was required from the EPA. The Restoration Report indicates that the community is in support of research needed for current data and "most detailed evaluations of water quality and hydrology that exist for the area are now 20 years old, and that the closure of sugar mills and abandonment of sugar plantations, concomitant with increases in urbanization and impervious surfaces, have changed the inputs into the bay in the intervening time" (Hilo Bay Watershed Based Restoration Plan, p. 5). The study further indicates that quality water current indicators for Hilo Bay are in need of being developed because its hydrology and the ecology of the area are unique from other watersheds studied in Hawaii.

Another point of difference the Hilo Bay WAG had with the EPA is with Best Management Practices (BMP) with identification and reduction of pollutants into the watershed area due to the complex natural environment of the watershed area. Identification of pollutant sources would be difficult to determine with land localities such as ranchland, agricultural fields and fecal matter from cesspools (Hilo Bay

Watershed Plan, p. 6). Pollutant sources such as fecal matter, arsenic deposits discharged from a canec plant and flood pollutants are well known and would be dealt as existing in the area. This would allow for implementation of options to restore the environment of the watershed area with community input while research factors were being developed.

The Hilo Bay Watershed Based Plan does indicate:

> "High exposure to toxic forms of arsenic can also cause birth defects, these effects are due to chronic exposure of arsenic in the air and water. This is not a concern in the Hilo area, as arsenic levels in water and fish muscle tissue are low. Consumption of fish from areas where arsenic is present in sediments is not a serious health concern" (p. 17).

The plan acknowledges the arsenic levels, but dismisses it as not being a health concern. These statements contrasts sharply with alternative assessment where an acceptable risk, such as arsenic contamination, are not acceptable to individuals and residents!

Many local residents would not agree with these research findings on arsenic, because the long range hidden effects of arsenic has yet to be seen or affiliated with certain illnesses. Many residents eat fish such as mullet, shellfish and gather duck eggs from this area regularly. Mullet, crabs and algae eating ducks are all bottom feeders where arsenic sits in muddy water. Arsenic concentration has been found to be in sediments from the Wailoa River that form part of Hilo Bay's beach area where

canoe paddling is held. Many children and adults swim in this area where sediments or sand containing arsenic are stirred-up and swallowed while swimming or playing in the surf. University of Hawaii Hilo Assistant Professor Debra Weeks confirms that local residents and visitors may be ingesting arsenic and shares that she will not let her children go barefoot in Wailoa Park. In the *Malamalama Magazine* for the University of Hawaii (May 2005) Weeks shares "until the distribution of arsenic has been fully studied, this level of discretion is reasonable" when it concerns her children and family (http://www.hawaii.edu/malamalama/2005/05/f3_water.html). Until, it can be proven that arsenic is not harmful – options should be considered with removal and containment of arsenic contamination.

A common biological component to indicate that the Hilo Bay Watershed area is flourishing from better water quality would be the monitoring of developed algae, coral and marine life in Hilo Bay. In 2003, researchers from the Hawaii Coral Reef Initiative (HCRI) found a mat forming invasive species of algae spreading in the area of Hilo Bay. In areas outside of the Hilo breakwater and at Puhi Bay -- coral recruits were found, but no large coralheads. There was no evidence of disease and the coral were healthy. 19 different species of coral at depths of 17-feet and 35-feet were recorded. 42 different species of fish were recorded and the two most common are the Hawaiian mai`i (Acanthurus nigrofuscus) and the hinalea (Thalassoma duperrey) (http://www.hawaii.edu/ssri/hcri/rbi/hawaii/puhi_bay.htm).

The *Hilo Bay Watershed – Based Restoration Plan* was revised in October 31, 2005 and includes handwritten transcripts by reviews of the public review done with community members (p. 165). Majority of the transcripts were done with

community agency members such as Department of Forestry and Wildlife (DOFAW), the Soil, Water and Conservation District Agency (SWCD), and the Hawaii County Planning Department. There are no transcripts from individual community citizens who attended announced community meetings. This is another narrow scope of the restoration plan that affects many citizens. Public meetings may have been held when many community members could not attend due to being a busy time of year (holidays) or there may have been a large community cultural event such as the hula festival, Merrie Monarch. At a marine fishery meeting held at the Hilo Mokupapapa Discovery Center on November 17, 2005 at 6:30 pm there were no fishermen, because the meeting was held on an evening during the busiest fishing season of the year! The fishermen who were being affected by new laws were out on business and only researchers and marine agencies attended the meeting for community input.

The transcripts of community input are very biased and do not consider the recommendations or ideas at face-value from community members. Deputy Director of the County Planning Department, Roy Takemoto, discusses:

> "A major section that seems to be missing is a discussion on previous studies and history of Hilo Bay – how did we get where we are. For example, the arsenic from the canec plan – is this still a concern in the sediments? If so, how does this affect the bottom feeders (crab and mullet)? (Hilo Bay Watershed Based Restoration Plan, October 31, 2005, p 191.)

A comment in italics from the recorder is: *[We do address all these points in this section]* (Hilo Bay Watershed Based Restoration Plan, October 31, 2005, p 191.)

If the community still feels there is danger from arsenic deposits in the Hilo Bay area then there should be consideration for further discussion on why this continues to be a community viewpoint. The topic of arsenic has not been addressed when community members questions its existence in the environment.

OTHER IMPACTS ON MARINE LIFE AND ECOSYSTEMS

Marine education and research continues in the area of human impact to marine life and ecosystems. Our ocean is part of our life here culturally and socially as a way of life. As native Hawaiian, Paula Kekahuna stated, “The ocean is our refrigerator but we need to be better at shopping or there will be a time when the fish and sea life that has sustained us will no longer be there. It will be wiped out because we didn’t keep the ocean clean” (P. Kekahuna, personal communication, November 25, 2005). The ocean is also an invitation to many visitors who want the experience of feeling the surge of waves against their bodies, to taste the salt water as they enter our warm waters and to see our colorful tropical fish and mammals such as the Hawaiian turtle, the honu.

The most impact done to our coral reefs are from divers and snorkelers who will sometimes stand or hold onto coralheads below the water. Many of us have done this type of damage to our coral reefs, because we were unaware of the coral reef as a living organism or we never thought it did any damage at all in the ocean! Coral reef Biologist, David Gulko (1998) confirms that we need to “Think about the

impact of your actions underwater on both the organisms and the community as whole before you interact with any of the residents of the reef" (p. 204). Gulko describes in *Hawaiian Coral Reef Ecology* many of the actions that one should consider and think about before entering the water. Some of these actions are:

- Photography – the manipulation of the environment for a perfect picture creates habitat disturbances. The flash of a camera can frighten marine life who may not return to the area
- Feeding marine life – this is very controversial and especially with shark cages. Hand feeding alters fish behavior. In an interview with older local fishermen who used live bait in the 1950 – 1960's it was noted that fish habits changed when "dead" bait was used with handline fishing for tuna (Y. Sugahara, personal communication, October 5, 2005).
- Swimming with whales and dolphins – This has become popular over the past years and some have advertised it as a "Hawaiian Cultural Experience" to visitors and newcomers. It is against Hawaiian culture beliefs and it does not respect the ocean as being the home of marine life -- we are intruding in their environment. This activity is dangerous and swimming with whales is an illegal activity in Hawaii under the NOAA National Marine Fishery Services Endangered Species Act (http://www.nmfs.noaa.gov/pr/species/).
- Touching and handling turtles – Turtles are to be respected and left to "sun bathe" on beaches. Turtles are also protected under the United States Endangered Species Act. Learn to enjoy them from a distance and give them

the “right of way” when swimming in waters where they are living (http://www.nmfs.noaa.gov/pr/species/).

Another concern has been the impact on the coral reef fish industry for aquariums. In an interview with Native Hawaiian Marine Biologist, Noelani Puniwai, it became evident that Hawaiian coral reef fish are prized for aquarium hobbyist because of their beautiful vibrant colors that can only be found in Hawaiian waters; however, these special marine animals have not reproduced well in captivity. Puniwai confirmed that the preservation of coral reefs are needed for the reproduction of these marine animals to sustain a vital industry in Hawaii. It is clear that there has been an impact on the depletion of coral reef fish and fish “stock” will need to be replenished if our economy continues to demand these “specimens.” Puniwai explains, “The fish replenishment areas where fishing is banned were enacted for such purposes. If the coral reefs are destroyed then the coral reef fish have no home to live in and reproduce. You need a healthy coral reef ecosystem and that means keeping people out of the designated areas.” In regards to Hawaiian culture – the collection of coral reef marine life is seen as not being “pono” or in-tune with Hawaiian cultural beliefs. “Marine life was caught for subsistence living and not as an ornamental prize possession” (N. Puniwai, personal communication, December 7, 2005).

Marine scientist, Brian Tissot (2005), confirms in his research that the Hawaiian cultural belief systems and subsistence living practices are a sharp contrast with harvesting live reef fish solely for economic gain and exporting it out of Hawaii. Subsistence living means sharing with your family or `Ohana but “selling

live fish for solely economic gain stretches the more traditional Hawaiian concept of subsistence catch" (p. 12). Ethically, collectors are thought of being "waha nui" or having "big mouths" – a Hawaiian connotation to being greedy and a sharp contrast to Hawaiian cultural beliefs where food and other items are shared among family and community members.

To address the demand of the coral reef fishing industry, the Hawaii Coral Reef Initiative Research Program HCRI-RP) was developed to support research and monitoring of Hawaii's coral reef ecosystems. The HCRI-RP has estimated that the western shores of the island of Hawaii where coral reef systems flourish generated an added-value industry of $17.7 million-a-year (http://www.hawaii.edu/ssri/hcri/ev/hawaiis_west_coast.htm).

To protect the industry and the coral reef environment there are now designated Fish Replenishment Areas (FRA) where no fishing of any sort is allowed. The FRA areas provide a breeding ground for the coral reef environment and coral reef fish stock to be replenished, and eventually move into nearby marine habitats where divers catch yellow tang fish. The FRA areas are being closely monitored in the event research data will help to establish new areas in places like the Hilo Bay Area.

COMMUNITY VISION WITH MARINE MANAGEMENT

Many of the environmental assessments done in East Hawaii have not taken an active approach to developing a community vision with marine management of Hilo Bay and its coastlines. There are many considerations to consider that have

been discussed in these assessments and there are many new lessons to learn as plans develop. An area where more consideration is needed is with the participation levels of community members to develop a vision with marine ecosystems and developing sources for sustainability with a community vision.

The Appreciative Inquiry (AI) method has been used to gain community and individual participation with other organizations and focuses on the value of hearing people's stories and the knowledge that can be shared with others. Many of the cultures in Hawaii have a tradition of storytelling and this would be a positive way to engage community members in the vision process. The AI method is described by Sue Annis Hammond (1996) as "memories of energizing moments of success" and "participants walk away with a sense of commitment, confidence and affirmation that they have been successful" (p. 7). Rather than focusing on negative attributes with marine ecosystems in our area, the positive stories could create synergy that will focus on having a healthy positive marine ecosystem that is flourishing and being enjoyed by everyone. This method creates the foundation for a community's dream to emerge for the future.

Often times there are many organizations that want to collaborate together, but the opportunity to collaborate and network in solving a community problem or situation gets lost along the process. Another strategy for community development can be developed with the use of recognizing community capitals that are assets toward community sustainability. The use of community capital frameworks are not seen as a solution to all problems or situations, but a process that can reveal new ideas and situations where communities and organizations may need to adapt goals.

This can be a very challenging concept for communities and organizations that are goal oriented, but a positive method for those who are willing to look at alternatives and working together for sustainability.

What are these community capitals? The four forms of community capitals described by Cornelia Flora (2001) are:

1. Human Capital -- skills, abilities and knowledge
2. Social Capital – interaction between people, networking, collaboration, building relationships, communication skills
3. Financial/Built Capital – Civic and social entrepreneurship, Tourism
4. Natural Capital – environment, parks, marine landscape, nature

At a Community Capitals Framework Conference (2005) additional community capitals were included and they are:

5. Cultural Capital – How people know the world, Hawaiian and multi-cultural beliefs and practices such as hula festivals, Ohana belief system
6. Political Capital – Local, County, State and Federal Representatives, Hawaiian Cultural Practitioners

Another clarification was made at the conference with Financial and Built Capitals that are now defined in two separate categories. Financial capitals are described as being “financial resources available to invest in community capacity building, to underwrite businesses development, to support civic and social entrepreneurship, and to accumulate wealth for future community development” (p. 127). Built capitals are described as being “infrastructure that supports the

community such as telecommunications, industrial parks, main streets, water and sewer systems, roads, etc. Built capital is often a focus of community development efforts" (p. 127).

Recognizing community capitals can greatly develop plan for stewardship that includes building alliances and networking within the community to develop an **East Hawai`i Community Based Marine Management Plan** for marine recreation and conservation with preserving marine ecosystems. There continues to be a culmination of individual "plans" for East Hawai`i that have been done by various agencies that include the Hilo Bay Watershed Project, the Big Island Reef Fund and the DLNR-DAR Marine Protection Plan. Many of these organizational plans overlap with each other on their goals and community members are not fully aware what the organizational outcomes are with these organizations. Communities that are not fully associated with marine or water conservation are even unaware of these organizations. At a random poll of residents at the Hawaii Community College, 90% of those polled did not know the existence of the Hilo Bay Watershed Project and the Big Island Reef Fund. 90% of those polled did know the DLNR-DAR Agency (Bergknut, L., 2005). A community based comprehensive plan that includes AI stories of community members and finding common goals for marine stewardship of East Hawai`i with these organizations could help to develop a community vision plan. Community based management would involve a process that empowers the community with community capital resources that include cultural and historical preservation. It would also allow an avenue for conflict resolution when community members and organizations do not agree on goals and outcomes. The AI process

could also gather and evaluate community feelings on the impact of residential growth, the increase of visitors to the island and the increase in a variety of marine activities that include the Cruise Line industry which have yet to be felt or known.

COMMUNITY BASED MARINE MANAGEMENT & STEWARDSHIP

The East Hawai`i environment continues to change as the community begins to become global and a need that is being voiced by community members is the formation of an **East Hawaii Community Based Marine Management Organization** that would monitor activities and provide education in our schools, with visitors and all residents. The organization could determine goals with focused areas in the East Hawai`i coastal areas that would be a priority with the community and with community input – focusing on marine management goals and a community vision.

Currently, organizations involved with marine management are disconnected and have not networked extensively within the East Hawai`i community. An example is the Department of Land and Natural Resources Department of Aquatic Resources (DLNR-DAR) that focuses on regulations and enforcement of Federal, State and County laws. DLNR-DAR on the island of Hawai`i has only one agent that does enforcement and education. The lack of resources for funding more personnel has played a major factor in public education and outreach within communities.

In sharp contrast, the West Hawai`i community has managed to develop a community based plan with agencies and have developed the West Hawai`i Fishery Council. This was accomplished with the assistance of the University of Hawaii Sea

Grant Program, the Malama Kai Foundation and the Big Island Reef Fund. Community organizations and members form the 46 members coalition. (S. Peck, personal communication, November 17, 2005).

There are several agencies in the Big Island community that would benefit from networking with each other for resources and with outreach in the community. Some of these agencies include DLNR-DAR, the Department of Health, the County of Hawaii Parks and Recreation, the University of Hawaii Hilo Marine Option Program, the University of Hawaii Sea Grant Program, the Nature Conservancy, the Hilo Advisory Watershed Advisory Board, Environment Hawaii, the Malama Kai Foundation and the Hawaii Visitors Bureau. Community organizations within East Hawai`i from various neighborhood boards and business organizations such as the Keaukaha and Leileiwi Community Associations, the Downtown Hilo Association and Envision 2025, the Norwegian Cruise Line, the Hilo Trollers, the Edith Kanakaole Foundation and individual community members would be a vital part of community ownership and sustainability.

Individual ohana (family) members connected to traditional fishing practices, Kupuna (Hawaiian Elders) associated with various Ahupuaa, and Hawaiian Cultural Specialists would also be another important contribution to the formation of community-based management. These are members in the community who can provide a balance with their traditions and coming from various land divisions as part of cultural and social capital.

Another aspect is having technical assistance for advocacy with understanding current legislation and public policies that will affect the management

of certain areas that will be designated as Marine Protected Areas (MPAs). The Big Island Reef Fund (2005) organization describes the two types of MPAs and they are:

1) Marine Life Conservation Districts (MLCD) that allow limited fishing. The Waiopae Tidepools in Kapoho is the only MLCD designated area in East Hawaii.
2) Fishery Management Areas (FMAs) that prohibits aquarium fish collecting are located at Hilo Harbor, Wailoa River, Wailuku River and the Waiakea Public Fishing Area.

Legislation for new MPA designated areas are being sought for East Hawai`i and they are very controversial. The controversy is also heightened by the lack of information on the purpose behind the legislation action and misinformation from those who are afraid of changes that can affect their livelihoods. Current advocacy against MPAs can be seen with advertising in the *November 2005 Hawaii Fishing News* that labels it as "*Environmental Terrorism*." It must be noted that this is a personal viewpoint of certain local fishermen who feel that "fishermen are in jeopardy of losing their fishing spots and won't be able to use the ocean for recreation or food" (Sakamoto, 2005). What other stories would we hear if an AI interview process was done with these fishermen? Would they still consider themselves as being environmental terrorist? These stories are yet to be heard in the future and I look forward to hearing these fishing tales. It should be noted that Mr. Sakamoto was contacted and "had to think about it" (M. Sakamoto, email communication, October 27, 2005).

Legislators and public officials may not be aware of conservation methods that local fishermen and Native Hawaiian groups would want to consider with traditional fishing methods and seasons. Local organizations may not have the skills to present their viewpoint to legislators at a public hearing or know the process of a written testimony. The East Hawaii Coastal Marine Management Organization could assist and advocate these viewpoints with Federal, State and County agencies to have special allowances in new laws and to receive more funding with personnel at beach parks such as lifeguards who monitor recreational activities. Community members who have access to political capital and have success stories with civic engagement and advocacy would provide an important asset to this process.

Technical assistance can be a positive mode in developing an economic development plan with the marine industry, the recreation industry and with tourism. It can also be a way to develop social behavioral changes in the dynamics of governance and how we relate to community. Relationships are important to bonding and making social connections with other people to make things happen. People who have this skill could contribute as part of social and human capital.

Educational opportunity for networking with organizations such as the nonprofit organization, Malama Kai Foundation, can provide funding opportunities and cosponsorship with *Reeftalk* programs. The *Reeftalk* programs are a monthly public lecture series that has been ongoing since 1990 through the support of the University of Hawaii Sea Grant program in West Hawaii with funding from the Malama Kai Foundation (www.malama-kai.org). The Malama Kai Foundation is an asset with the community service and funding they provide that invests in the

environment as a financial capital. The Malama Kai Foundation's Board are from different community organizations involved with marine activities and prove that interactions and relationships between people who have a vision can be successful and positive.

CONCLUSION

The East Hawaii community of the island of Hawaii are filled with members who have a desire to protect the natural marine environment that surrounds their city of Hilo and their island. Community members in nonprofit and government agencies, business owners, community associations and individuals all have a desire to improve the quality of life enjoyed here in Hawaii. Many of these community members come from different socio-economic and educational backgrounds, but they all have a deep connection to environmental stewardship and respecting cultural values. The Appreciative Inquiry method can be an invaluable resource in developing success stories for positive interaction and bonding among participants and the natural beauty of our environment. The recognition of the community capitals available within East Hawaii can be a positive way to begin a vision process with stewardship of our fragile marine ecosystem. It is not a solution or outcome but an evolving process that can be positive avenue for all of our natural resources, our visitors who want to experience our environment, and our `Ohana that live daily together with the environment.

"Know that we are stewards of the land and the ocean. Aloha is to share, to give and to receive. The sunlight and the moonlight are our source of energy. We

need to know those things are important to us. The importance has to be every day, all the time" (Hawaiian Kupuna, personal communication, November 25, 2005).

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